

CHAPTER 13

From Construction Camps to Air Bases January–October 1981

Our Israeli friends have criticized us for paying too much attention to time and not enough to quality and not enough to cost control. There is no question in our minds that all three of them are important, but if we had to give emphasis to one at the expense of the others, it would be to time. That is the most important.

Brig. Gen. John F. Wall¹

In the spring of 1981 the project showed many signs of the changing rhythm of a fast-track job well on the way to completion. Design and procurement were nearly done. Both construction contractors had the bulk of their purchasing under control, and the emphasis there shifted from completion on schedule to containment of costs. The few problems involving the confusion regarding American, European, and Israeli specifications for materials served as reminders that the completion of purchases still held the key to the efficient and timely end of the project. Construction itself was in high gear, and, although it was massive, it was generally not complex. On the management side, emphasis was shifting from the schedule to the budget. Along with the new focus came more audits and the possibility of legal disputes with the contractors, as well as an even greater stress on planning for phasing out the project, now at the peak of construction.²

Procurement underwent a transition parallel to that of overall project management. During 1981 the focus moved from meeting the schedule to containing costs. Lee Graw thought the shift came too late to be very helpful. Still finding surpluses and redistributing them between the sites remained possible. The adjustment of priorities brought more intensive reviews from the headquarters and heightened area office resistance. At the sites, changes in procurement activities came quickly after meeting the 90 percent goal. In the spring of 1981 the construction contractors began expediting the remaining procurement actions. They sent representatives to vendors

in North America and Europe as well as to Israeli suppliers to assure timely deliveries. In the United States the New York support office assisted with this effort; in Israel the Ministry of Defense helped.³

Despite the emphasis on expediting the remaining purchases, lack of such common objects as doors and windows delayed completion of buildings. In part the situation resulted from the increased procurement in Israel in 1980. Israeli vendors did not understand the American purchasing process, so the project staff lost time explaining specifications and negotiating prices. With Ministry of Defense help, problems were resolved and production picked up. Before deliveries caught up with construction, however, some structures were finished without doors. In another instance involving a mundane necessity, the supply of cement had been endangered by an autumn 1980 strike at Neshet, an Israeli firm. The bases needed about 275,000 metric tons of cement, and any interruption of supply would have threatened the schedule. Management Support Associates' general manager Alan Shepherd found a source of offshore cement in Turkey, and its availability helped stabilize supply for the project.⁴

Another difficulty related to procurement involved overbuys. With purchasing sometimes moving ahead of design, excess stockpiles of supplies were inevitable. "I suspect," Hartung said in April, "we're going to have a few million dollars worth of residual materials. That's part of the premium of fast-track." The overbuy came to between \$10 million and \$15 million, which was not excessive considering the size and haste of the job. Insufficient purchases would have been worse. The project dealt with excess materials in a variety of ways. In some cases, one construction contractor bought too much of something that the other needed and sold the article to the other site. Such transactions, which provided convenient solutions at no extra cost to the program, were handled through discussions and the exchange of lists of excess inventory. Cooperation between the contractors, which were accustomed to competing rather than sharing information, did not come naturally. However, with some encouragement from the Near East Project Office and the area offices, they overcame habit and shared data on drawings and materials on hand as well as equipment and supplies. Bar-Tov believed such cooperation came too late and was never enough, but business practices developed over many years did not change easily.⁵

There were other ways to cut inventories. The U.S. Army Sinai Construction Management Office proved helpful. This office was established in Tel Aviv in August 1981 to manage "the accelerated design and construction of two military life support facilities in the Sinai Desert." These camps, constructed by a consortium of con-

tractors known as the Facilities and Support Team (FAST), built and maintained bases for Norwegian Lt. Gen. Fredrik Bull-Hansen and his Multinational Force and Observers.⁶ This international force, which included American soldiers from the 82d Infantry Division (Airborne), patrolled the Sinai during the period of the Israeli withdrawal and the Egyptian reoccupation. The American construction organization, commanded by Col. William E. Lee, Jr., remained in Israel until it completed its mission in the fall of 1982 and was disbanded the following year.⁷

At first it appeared that the new office would create an unwanted distraction. Wall and his superiors disagreed on control of Lee's operation. Because he was the senior engineer officer in Tel Aviv, Wall thought that Lee should report to him. The chief's office disagreed and assigned the new project directly to Washington. Wall already had a large enough job to manage and was charged with providing administrative, logistical, and technical support for the new operation. Lee, who needed office space and quarters for his people precisely at the time that Wall's requirements declined, paid the project for the use of the Palace Hotel. He also bought some surplus rations and construction materials. All told, the new office saved the project about \$1 million.⁸

In dealing with excessive spare parts for construction machinery, the project employed a third and less satisfactory approach to reducing the stock. According to Hartung, the unanticipated excellent performance of the Fiat-Allis equipment combined with a lack of control over contractor purchases early in the project produced a surfeit of parts. In any case, large quantities had to be sent back to the manufacturer. After lengthy negotiations, the project paid \$211,000 for restocking, shipping, and interest on the returned components.⁹

In the ten months between Wall's 90 percent target date and the 25 October 1981 joint occupancy date, virtually all problems with shortages and overbuys came under control. Overall, Ovda was in better shape than Ramon. The southern site still had problems with purchases of unique items and with windows and doors, but productivity was improving and substantial amounts of materials were being transferred to Ramon. Graw considered Ovda "out of the woods," and worried more about Ramon. The tension and distrust between the area office there and Tel Aviv persisted, making it difficult to solve the material deficiencies that remained.¹⁰

More and more, as the year passed, relations between the Near East Project Office and the program managers became bound up in the financial questions. The three generals seldom agreed com-

pletely on the issues of how much the job would cost, how the money would be provided, and who would pay.

Although Bar-Tov and his staff may have been under pressure from their government to finish the job as far under the program estimate as possible, they also were driven by their own concerns for economy. Bar-Tov's public affairs officer, Lt. Col. Karni Kav, who had gained a measure of fame in the 1967 war when as a lieutenant she had been among the first combat troops to enter Jerusalem, echoed this concern for frugality. Nevertheless, the Israelis understood the urgent need to comply with the deadline. Like Deputy Minister of Defense Zippori, who had warned that his forces would not move from the Sinai if the bases were not ready on time, Bar-Tov knew that the deadline was central. He was no more interested than the Americans in asking the Egyptian government for a delay.¹¹

Wall's priorities, as he explained them to a small group of new staff officers who arrived in Tel Aviv in June, reflected the progress of the job and the evolution of the program's concerns. In December 1980 his primary consideration had been placement of construction, followed by procurement and adherence to a schedule that provided fifty days of flexibility. Six months later he called cost control "definitely number one" among his priorities. Site activation came next, followed by elimination of changes in construction. Such changes had not been on the previous list but had become a matter of great concern for much of 1980. In the spring of 1981 the changes once again caused friction among the managers. All of the old arguments and issues related to construction philosophy and project control were restated, and only firm management held down changes. Further down the list stood procurement and placement of work. Ranked first and second in December, they were now fourth and fifth, respectively. Inventory control, phasedown, and safety—in the rush to build the bases three workers had died in accidents during a two-week period—completed the eight-item list.¹²

Although it was becoming plain that the critical objective of initial operating capability would be reached, budget problems began in the spring of 1981. In mid-March Wall learned that Ovda might cost more than expected. The area office informed him that permanent materials were costing more than had been projected. Blake cited the seriousness of the problem, fearing that the Near East Project Office staff would hide the situation from Wall. He was concerned particularly with the engineering division's estimators, who he thought had an interest in defending the more optimistic figures they had developed earlier. Blake thought Wall was "sur-

rounded by staff who do not want to tell him any bad news," and that if any arose, they would "try to mitigate and confuse it." So he made sure that his assessment got to Wall, telephoning him first and later meeting with him personally. "If we have a disaster in the wings," Blake said, "we need to face up to it."¹³

Wall referred to the news as the "bombshell on NAC costs." Alan Shepherd, who was with Wall when he heard the Ovda briefing, said the report "just about devastated the Project Manager, BG Wall." Shepherd understood that the news had far-reaching implications for project management. He estimated that the increase in costs at Ovda could result in an overrun of as much as \$20 million—about 2 percent of the total cost—for the program. Such a development would shift management's focus from completion of facilities to budgetary matters. "It is important that we understand," he told his staff, "that even though cost is not the number one priority to the U.S. government's interests, it is the number one priority to the Israeli government and, as such, the political pressures between the two governments will cause cost problems . . . to become a major issue."¹⁴ Essentially, he feared that construction issues were becoming political ones.

From that point on, although Wall pushed both area offices to complete facilities, he always kept an eye on the budget. He saw several reasons for the higher estimate for Ovda. Foremost was the increased cost of permanent materials, due in part to panic buying at the end of 1980 in a desperate effort to reach his 90 percent goal. The site also had bought too much reinforcing steel, and the kindergarten in the residential area was headed for higher construction costs.¹⁵

The spring of 1981 signaled a transition in Wall's evaluation of the financial situation. Hartung remained sanguine about delivering the bases within the budget. However, he turned aside Israeli requests for a reduction in their commitment, and told Director General Ma'ayan that the large number of engineering change proposals and the constant direct contact between Israelis and construction forces clouded the financial picture. Perhaps influenced by Blake, Wall became concerned that the estimators painted too optimistic a picture, giving Hartung and himself data that might prove wrong. Still, Wall remained unconvinced that an overage at Ovda would cause an overrun for the whole project. At the end of June he thought he was still—barely—within the budget.¹⁶

Late in the same month Bar-Tov and Ma'ayan started to insist that an overrun was certain and seemed to step up their scrutiny of outlays. Some Americans complained about the Ministry of Defense's close surveillance, but none should have been surprised

when it increased. That the Israelis were the first to see that the cost of the job would go over the budget was appropriate. They had watched the outlays more closely than had the Americans and would pay the bill in the event of an overrun. On the other hand, reaching that conclusion must have been difficult for them. After all, they had only recently urged Hartung to reduce the program amount so they could cut their commitment. As for Wall, his notes of the meeting show his reaction. He recorded it with one dramatically punctuated word: "Tilt!"¹⁷

Before the summer ended the chief's office sent Fred McNeely and a team under chief estimator John Reimer to assess the situation. The headquarters anticipated a high-level Israeli effort to convince the United States to pay any additional bills. Some people in Wall's office resented the lack of confidence that such an independent analysis implied, but Washington needed precise financial information. Reimer's team spent six weeks of August and September in Israel. They arrived at an overall current working estimate of \$1.077 billion, including \$13 million for contingencies. Their total came fairly close to that of Wall's staff. The most significant disagreement with Tel Aviv involved the anticipated cost of the base at Ramon, particularly the final price tag for permanent materials there.¹⁸

From that point the only question in Wall's mind involved the magnitude of the overrun. Yet, even after the scuttling of the budget became a certainty, Wall kept his perspective on the overall effort. He continued to insist that the area engineers had done excellent jobs and that the base construction was superb. Reviewing the estimators' report, General Wilson agreed: "We of course recognize that the replacement product (Ramon and Ovda) is far superior in quality and quantity to the original model (Etzion and Eitam)." ¹⁹

By the autumn of 1981 only Hartung still insisted that the job would be completed within the original \$1.04 billion budget. He rejected the Reimer team's analysis and Wall's current working estimate of \$1.042 billion as too high and considered the additional sum set aside for contingencies as excessive. He viewed estimating as an inherently pessimistic art, in this case reinforced by the negativism of other participants in the program. "The biggest thing I have heartburn with in this whole program," he said, "is that there are so darn few people that have any vision." Passive management that was indifferent to waste could still cause additional and unnecessary costs, but he did not consider an overrun inevitable.²⁰

The disagreement between Wall and Hartung on the final cost stemmed from profoundly divergent understandings and differing analyses of the situation. By the fall of 1981 Wall and his staff in-

sisted on charting obligations—commitments for future payments—rather than actual expenditures. In fact, Wall attributed his earlier surprise at predictions of higher costs to his concentration on current spending rather than longer term obligations. His office now understood that it had to plan for funding well ahead of actual outlays. These commitments provided the best yardstick of total requirements. Moreover, because Wall could not obligate money he did not have, they also determined his financial needs at any given time. This concentration on obligations reflected standard Corps practice on cost-plus contracts for at least thirty years. The 1951 manual emphasized that it was “extremely important that the contractor’s accounting system adequately provide for the current recording of all obligations and commitments in connection with the contract in order that overruns of available funds may be avoided.”²¹

Hartung disagreed with the Corps view. He contended that the emphasis on planning for obligations was misplaced and represented “fixed-price thinking.” He resisted management of obligations and stressed the need to validate requirements as raised by the contractor. As far as he was concerned, management of obligations merely assured the availability of money that the contractors wanted instead of verifying the actual need.²² The issue of the actual cost of the program remained unresolved until all of the bills were counted many months later; the dispute regarding the proper approach to financial management was never settled.

Even those who agreed that the total cost was likely to be more than originally expected differed regarding the causes. The numerous contributing factors were materials, unexpectedly low productivity, engineering change proposals, and the use of local workers.²³ However, at that point in the fall of 1981 the major question still dividing Hartung and Wall was the amount of the final bill.

By the time the estimating team left Israel, the initial optimism about completing the job within the program amount—Morris’ goal had been 10 percent less than that sum—was forgotten. Wall’s current working estimate of \$1.042 billion hovered just above the project figure. At that point control of contractor expenditures with an eye toward future obligations tightened considerably. Wall explained his intent with characteristic bluntness: “Effective immediately, I am directing a series of management actions to prevent more effectively contractors from incurring any additional unnecessary obligations and to manage better our meager resources.”²⁴

The project’s financial options were very limited by that time. Manpower was becoming the key variable. Beyond that, with procurement largely completed, only life support provided major possibili-

ties for cost reductions. Overall, adherence to the schedule remained a top priority for a cost-conscious management. The American presence became more expensive in relation to the work done as the job approached the end. As Hartung observed, "The quicker we can convince our Israeli friends that we ought to get out of their hair and then they finish it up, the better, from a cost standpoint."²⁵

Nevertheless, Wall did not content himself with demands for reducing the costs of labor and life support. He insisted that the area offices slash expenditures everywhere and imposed unusual requirements to make sure that they did so. Withdrawing the blanket authorization for purchases under \$25,000, he required Kelly and Griffis or their deputies to scrutinize every purchase order for over \$1,000. He also called for redistributing excess supplies between the sites where possible and turned to Maloney's office for audits of all unfilled purchase orders. Wall stopped short of consolidating contracting officer operations in Tel Aviv because he feared that such a change might cause unnecessary problems, especially with the critical joint occupancy date approaching in October. He never forgot that adhering to the schedule still held the key to cost containment as well as to accomplishing the mission: "We will build airbases to meet activation schedules and, in so doing, will insure that final costs are reduced to absolute minimum."²⁶

Whatever these final costs, Wall still had to ensure sufficient funds to pay them. Because of the 1980 procurement rush and an accelerated construction schedule, the project was rapidly running out of money. Based on the survey team's analysis, Wall calculated that he had enough to fund work into January. To ensure that operations continued smoothly thereafter, he needed authority before the end of November to incur additional obligations. If the money was not forthcoming, he feared that the contractors could start to close down operations. With Wilson's approval, Wall formally notified Hartung that he expected the total cost to reach \$1.077 billion and asked that he get the additional money from the Israelis.²⁷

Ironically, Wall's increasing control of construction in the autumn of 1981 was matched by declining control over project funds. Up to the point at which he needed to ask for additional money from the Ministry of Defense, his office had managed the balance of program money. The first financial transition, from American to Israeli funds after the initial \$800 million ran out early in 1981, had already passed smoothly. It had been well planned and controlled. The chain of communications from Wall's office to Hartung; then to Headquarters, United States Air Force; and then to the Israeli Procurement Mission in New York, which provided the money to the Defense Security Assistance Agency in Washington;

had worked well. The money was there when needed, and the program conducted its business as usual. Harmonious relations between the Americans and the Israelis in general and Hartung and Bar-Tov in particular remained unchanged.²⁸

By August 1981 nerves were fraying. Work at the sites was building up to the joint-occupancy climax. In Tel Aviv the managers argued about the potential for overruns and the control of change proposals. Wall saw a split develop between the program managers, with Bar-Tov "driving Hartung nuts." Hartung, who still lacked the level of control that he desired and who disagreed completely with Wall on financial management, called his assignment the "most frustrating job I ever had." Wall himself, who usually smiled long after the others gnashed their teeth, was troubled by high blood pressure and also feeling the strain. "I'd rather fail graciously," he wrote, "than be captive to cantankerous non-professionals."²⁹

As management wrestled with the issue of providing funds to complete the job, the question of who would pay the bill for the overrun also arose. There was no question about where the formal liability rested; the agreement between the two governments clearly set forth the Israeli responsibility for any additional funding. However, no one was surprised when the Israelis asked the United States to pick up the tab. At an October meeting Ma'ayan reiterated complaints about the American preoccupation with the schedule at the expense of quality and cost. He told Bratton that he expected an overrun of between \$50 million and \$100 million and complained that Bar-Tov lacked sufficient control. The United States, he contended, should pay the Israeli share of the original amount and any overruns. Bratton, who thought Ma'ayan's estimate excessive, refused to commit the Corps to the additional payments. The question was political.³⁰

While the financial questions were debated, workers at both sites rushed toward the joint-occupancy deadline. In terms of the completion of facilities, joint occupancy almost equaled initial operating capability, which was the goal for the following April. Attaining the latter and more critical objective, on which the completion of the Israeli withdrawal from the Sinai and the peace with Egypt depended, primarily awaited the activation of the structures already completed. As Bill Parkes noted at Ramon in October, "We have almost fulfilled our obligation." Except for utilities, which proved extremely difficult to finish because of the blasting involved, "the base is operational."³¹

The agreement between Israel and the United States specified only attainment of initial operating capability by 25 April 1982. However, General Lewis had insisted on working toward earlier comple-

tion of the facilities so there would be enough time for site activation. Lewis chose 25 October 1981, six months in advance of the key date. At first he complained that Corps people responded slowly to this need, but by early fall of 1981, the late October "joint-occupancy date" was widely accepted as the crucial construction goal.

Awareness that the project would have to pass through a joint-occupancy stage came long before Lewis established this important formal goal. Joint occupancy represented the crucial transition during which construction sites actually became air bases. When the contractors arrived, they knew that the months before achieving initial operating capability would require them to work alongside the Israeli Air Force, installers from the telephone company, and others. Corps employees also recognized the need for what Thomas called "a three-dimensional interface." He had learned at Cape Canaveral that fast-track site activation required designers, builders, and activators to work alongside, over, and around each other. Planning for this phase started early in 1980. The area offices did construction-site activation interface studies, which they submitted to Tel Aviv before discussing them with their respective constructors. Months of negotiations and refinements took place before all agreed in August on a schedule, but the matter did not end there. The contractors, who until then had arranged their work for maximum construction efficiency, had to reorder tasks to coincide with the schedule.³²

During the first half of 1981 the concentration on activation increased. Hartung reminded Corps managers that the emphasis would soon swing from construction to installation and checkout, including the actual emplacement and testing of equipment, relocation of people from the Sinai, training of pilots and ground crews, and certification of the operational capability of both bases. He warned that coordinating the activities of contractors, subcontractors, installers, and Air Force personnel would create heavy demands on the Corps. He wanted to be sure that the Americans remained evenhanded and cooperative and did not favor other Americans unfairly. In April Wall named the construction division as his representative in the process. Along with the area offices and program managers, Carl Damico, the construction division chief, was to prevent unnecessary disruption of construction and to anticipate any potential problems. Wall wanted Damico and the area offices to conduct regular evaluations of the status of all facilities within ninety days of activation.³³

Before spring became summer the first turnovers for activation were under way. Not all were as fraught with problems as the first one at Ramon, which Area Engineer Griffis said was "sort of like a



Family housing, complete with camouflage netting, at Ovda.

Mongolian goat grab." The transfer of the ammunition storage area simply "bombed out," according to Griffis. The Americans in the regional civil engineer organization wanted to turn over the entire area at once; the Israelis objected because of pavement flaws in one portion. Problems also appeared at Ovda during turnover of parts of the radio transmitter and receiver work package because of a seven-page list of deficiencies, many of them trivial or irrelevant. Worse yet, Wall found out about the embarrassing situation from Hartung rather than from the area office.³⁴

Soon both area engineers saw the need for meticulous planning for the process. Ovda developed a list of prerequisites for orderly and complete turnovers. These needs included early identification of purchasing problems; coordination of procurement and building schedules; identification and correction of deficiencies with available materials; and development of a simple management structure to oversee the process. Ideally, beginning four months before the scheduled transfer, a project engineer with a bill of materials in hand for each facility would keep track of procurement for the structure and of any potential problems. Ovda's



Airmen's dormitories, with solar panels on rooftops, at Ouda.

system put the lion's share of the management burden on Negev Airbase Constructors; the contractor's field facility coordinator became responsible for meeting turnover dates. In doing so, he integrated the procurement and construction schedules and each week updated the exception report on the facility. The contractor also appointed an activation interface coordinator who kept a ninety-day activation schedule and prepared weekly reports on activation and deficiencies for a Corps employee with a similar title. The system was completed with a wrap-up crew. This group of workers from several disciplines eliminated all known deficiencies that they could correct with equipment and materials on hand.³⁵

For his part, Wall wanted a list of projected deficiencies thirty days prior to the completion objective date. The area offices provided this list to Damico at the weekly site activation meeting. Thereafter, the area offices updated their deficiency list at the two weekly meetings and presented a final list one week before the expected turnover. At the same time, the area office formally notified the construction contractor of the impending transfer of a facility.³⁶ A letter from the contract management branch included a reminder

of the upcoming date and specified requirements still unmet. The letter also named the responsible individual in the area office.³⁷

In the week that followed, the regional civil engineer and the area office divided the remaining problems into minor "punch list" deficiencies and major shortcomings, such as the lack of doors and air conditioners. The resultant compilation showed the post-beneficial occupancy work requirement. Griffis added other prerequisites for turnover. Before the area office offered a structure to the Ministry of Defense, reasonable access had to be assured. In addition, all utilities, including water, sewer, and electricity, had to be provided unless materials were not available. He also required plans for assuring continued access during the period of paving.³⁸

The increase in facility transfers in the autumn signaled the peak of activity for transition from construction camps to air bases. These turnovers showed great improvement over the first ones. The number of work-arounds declined but still made the Israelis unhappy. Typical of the overlaps and complexities of fast-track construction, the deficiencies that caused work-arounds and turnover of incomplete facilities represented many process components—delayed delivery of materials and equipment, late changes to structures, and even incomplete drawings. At Ramon utility problems due mainly to the difficulties involved in digging the trenches for the conduits worsened the situation. Griffis did what he could to fulfill his commitment to provide utilities. "We have," Bill Parkes noted, "just an unbelievable number of portable generators." The main challenge at Ramon became actual completion of facilities so that the construction crews could walk away confident that they would not have to return.³⁹

The American site activators prodded the Israelis to accept and move into facilities when they became ready, but the Israelis did not share their urgency. In part their caution reflected uncertainty about what they were getting, and both area offices understood the need for credibility with their customer. The job of overcoming that concern fell to the American members of the Air Force regional civil engineers. The area offices worked only with Hartung's staff, avoiding the distractions of dealing directly with the Israelis. They also cooperated with the activators of both countries in solving problems at the sites to prevent them from becoming political issues in Tel Aviv. All in all, the turnovers caused less difficulty and stress than some expected. Hartung turned out to be a strong central manager of the process, which nevertheless expanded the role of Bar-Tov's program management organization while focusing the attention of all on the facilities that the Israelis needed. Generally, constructors and activators moved cautiously and developed

procedures for dealing with each other that would minimize the number of inefficiencies.⁴⁰

Just as the requisites for joint occupancy came together, the Israeli concern for timely completion became public. Most of the complaints from the Ministry of Defense concerned quality or wasted money. Ma'ayan once told Wall, "You are too concerned with schedules." Nevertheless, in August 1981 the commanding officer at Eitam in the Sinai said that the Negev bases would not be completed in the agreed-on time. American papers picked up the claim, which first appeared in the *Los Angeles Times*, even though Minister of Defense Sharon promptly denied the existence of a lag.⁴¹

By the joint-occupancy date in October a tremendous volume of construction had been accomplished along with the months of planning for the turnovers. Half of the 120 aircraft shelters stood ready for planes. With only minor corrections still needed, the control towers, maintenance facilities, and many of the community structures for soldiers and their families were finished. Israeli Air Force families started to move onto Ramon at the end of July, adding their safety and comfort to the imperatives facing the area office. Runways were finished also. At Ramon a June ceremony had marked completion of runway "A" four months before joint occupancy. The observance featured the landing of a Mirage fighter by General Ivry and a short address by Griffis, complete with a trilingual greeting—"good morning, bon dia, shalom."⁴²

Throughout the months leading to joint occupancy the character of the job at both sites changed visibly. As major facilities were completed, the outdoor work was compressed into more compact areas. Then, as the deadline grew near, much of the effort moved indoors as crews concentrated on finishing touches. Most observers thought the quality of work improved as the year progressed. Some of the private Israeli consultants hired by Bar-Tov's office claimed that this was not so. Bar-Tov sometimes echoed this view, although he finally conceded that in general the bases were well built. Ivry, who more closely reflected the Israeli Air Force attitude, seemed satisfied. He called the Ovda base "operationally . . . the best we knew how to make." Hartung defended Wall against charges of inferior work. He and others thought the consultants' criticisms might have been self-serving, motivated more by their interest in perpetuating their positions than by a concern for quality. Griffis even characterized one group of consultants as "an unethical, sensationalist firm."⁴³

Problems with quality control and with creation of an oversight organization had been at their worst in the spring of 1981. Ramon's quality control group had started with too many labora-

tory people and too few field inspectors. This imbalance may have contributed to the difficulties with the cement mix in the previous year. After adjusting the ratio between laboratory and field personnel and firing negligent inspectors, the situation improved. At the same time, Ovda also faced a rash of quality control problems, none more frustrating than the survey busts. Sixteen crews working long hours under pressure inevitably would make mistakes, but Thomas had never seen a job with so many failures. An April reorganization broke up the sixteen crews, which had until then come under one supervisor, into four. However, this action was not enough. Blake and Robert Horton of the area office construction branch urged replacement of incompetent and inefficient workers. The new organization would be fine if it had the right people.⁴⁴

Ramon also had survey problems. In April the contractor annoyed both program managers by situating a transformer building on the site intended for another small structure. All was not lost, as Hartung noted, because "the other building can be moved; there's a place ninety feet down the road that's empty." Nevertheless, Bar-Tov wanted the contractor to pay for the mistake. Hartung put the issue in perspective, asking who was at fault: "Let me put on my contractor hat and ask you, government, where the hell were you while I was making this great mistake? You watched me build it." Wall agreed. Unless he could prove "gross mismanagement," the program would pay, in terms of lost time as well as money. The dispute brought to the fore the conflicting needs for speed and accuracy. If the contractor had to pay for every error, he would work more deliberately, putting the schedule at risk. With this in mind, Wall refused to penalize Air Base Constructors.⁴⁵

Neither quality control by the constructors nor assurance by Management Support Associates inspired complete confidence. The Israelis questioned the construction contractor role. The Americans were generally satisfied with the quality of the bases, but efforts to convince the Israelis of the propriety of constructor involvement did not erase all of their doubts. Others also had reservations. The area offices shared the general Corps reluctance to entrust meaningful technical jobs to a support contractor. Tel Aviv earlier had rejected the Management Support Associates proposal for centralized procurement; the sites never adjusted to the idea of quality assurance by a contractor. In the final analysis L. M. Harris, Wall's assistant for manpower, argued that "the Corps will never accept a contractor management team as equals. There is simply too much tradition and plain old bureaucratic obstinacy at work."⁴⁶

Although Wall's main objective from the start was meeting the deadline for initial operating capability, he believed that the users



One of the first Israeli Air Force fighters to land at Ovda.

would remember the quality of the work long after adherence to the schedule was forgotten. With this in mind, he insisted that the system for quality verification had to work well. To make sure that it did, he relied heavily on the project engineers. The area office construction branches were the focal points for this effort. The managers of the support contractor's quality assurance teams at the sites reported to the respective chiefs of the construction branches, rather than to their own parent organization. Also within the construction branch, project engineers oversaw specific work items or facilities, ascertaining the adequacy of procurement and making sure that schedules were met as well as ensuring quality. Completely responsible for coordination of design, purchasing, and construction for their facilities, they monitored and reviewed progress daily until final acceptance by the user.⁴⁷

Neither area office had an excess of project engineers. Ramon managed the job with two officers and seven civilians divided into seven assignment areas. Three of the nine doubled as a technical support group.⁴⁸ Nevertheless, in the summer of 1981 Griffis expressed his pleasure at how well the system worked: "I feel for the



Prime Minister Begin at the formal opening of Ovda Air Base in October 1981, flanked by the Israeli Defense Force's Chief of Staff, General Rafael Eitam (on Begin's right), and the commander of the Israeli Air Force, Maj. Gen. David Ivry.

first time in the project that we have a good tool by which to manage the cost-plus contract."⁴⁹

In October the elements of the process came together. However, joint occupancy was not achieved without tension and anger. Hartung once complained that Ramon did not seem intent on completing the shelters, and Wall recommended that a site visit would allay Hartung's fears. The proof was indeed evident at the bases. At Ovda the first Kfir fighter-bomber arrived on 18 October. Six more followed on 8 November. At Ramon four American-built A-4s landed on 25 October, joining another that had come earlier to test the systems in the shelters. The landings did not severely impair construction, but everyone found it hard not to watch. "Most everyone," Griffis wrote, "including me and my staff, generally drop what we are doing and watch the planes take off and land." Perhaps, Griffis hoped, everyone soon would become accustomed to the sights and sounds of the jets.⁵⁰

The construction crews quickly had ample opportunity to become familiar with the noise of streaking jets. Within two weeks full squadrons began operations at both bases. Wall maintained that the project had done more than meet the joint-occupancy goal set by Lewis. "I consider Ramon and Ovda air bases operational on 25 October 1981," he crowed. Since then, he added, "daily aircraft operations . . . have been part of the normal routine." As far as he was concerned, "All in the Corps can take justifiable pride in the Corps/contractor team here in Israel who at the JOD date [*sic*] are providing bases which are operational for at least a squadron at each six months earlier than the IOC date of 25 April 1982."⁵¹

A small ceremony at Ramon and a large public celebration at Ovda marked the achievement. Prime Minister Begin was among those at Ovda on 8 November. He unfurled the flag of the squadron that would be based there and thanked the United States government for help with the base, which he called "a great asset to Israel [and] an asset to the free world." Recalling that Israel had paid for peace with Egypt by giving up the Sinai with its two fine air bases, he called Ovda "a symbol of our striving for peace." Ambassador Samuel Lewis, the senior American official, echoed the prime minister, calling the American effort part of its partnership with Israel in the struggle for peace. Not everyone agreed that the opening of the new base was a positive step. Some veterans who had come as part of the squadron from Etzion could not hold back their tears. A female soldier shouted at the prime minister, accusing him of abandoning the Sinai and giving the airfields there to the Egyptians.⁵²

For journalists too the event brought into focus the still incomplete withdrawal. Few editors resisted puns, mostly ironic, on the name Ovda, which is "fact" or "fait accompli" in Hebrew. Beyond that, some pointed to the project as showing Israel's diminishing autonomy and power. The United States, one writer contended, slapped Israel twice: while turning over the bases to the Israeli Air Force, they provided airborne warning and command aircraft to Saudi Arabia and F-15 fighters to Egypt. He concluded: "The Arabs will defend and secure, the Portuguese will work and build, the Americans will supply and pay, the Europeans will supervise and control. For Israel only one role is left: to retreat. A fact—Ovda."⁵³

The expedited completion of the bases carried a high cost. The construction surge in 1981 started as an attempt to assure that the site activation schedule would be met. Management resorted to overtime as well as expansion of the labor force early in the year, which Wall called a "plus-up." Hartung put an \$8 million price tag on this growth, which also involved increased housing, equipment, and other support for the extra crews. The additional resources of-

ferred the chance to get ahead of the schedule. As Hartung said, "You continue to use that resource as long as you can keep it productive." The results were the dramatic achievement of October and, in Wall's words, "a frightful, frightful cost growth." There were other costs too. The drive toward joint occupancy caused physical exhaustion along the way and an emotional letdown later. As Shepherd said, "After you achieve a milestone such as the JOD, there's going to be a downer."⁵⁴

The 60-hour workweek was common on overseas construction. On some jobs, employees even worked thirteen 10-hour days before getting one day off. Such a schedule carried its own built-in inefficiencies. Long days of honest work, intensified by technology that made for greater productivity, had limited value. Two such weeks produced more results than two but less than three 40-hour weeks. Overtime exacerbated the situation. Ovda pushed its work force into 12-hour days for six weeks, even with the knowledge that beyond 10 hours the returns diminished rapidly. The effects of such long hours could be mitigated by extending the noon hour, but this step never seemed necessary. Shortly before the joint-occupancy date, General Wilson reminded Wall that "overtime beyond the 60-hour workweek should be avoided." He pointed out that "studies show that increased overtime results only in worker fatigue and production is actually reduced."⁵⁵

Despite the effort and the success that it brought, much work remained. A reporter who visited Ramon for the Israeli Air Force's monthly magazine noticed "a new [dormitory] building, shining, beautifully built" that had no paved approach. In the family housing area, the homes were "lovely, air conditioned," but again without pavement. Overall it was "still a long way to the completion of the whole project."⁵⁶ Management too had plenty to do before the project could be considered finished. The huge labor force would have to be reduced while the bases were being completed. The financial issues, which seemed always to straddle the line between internal questions and broader political issues, still needed solving. And, finally, the whole organization needed to finish the job and leave Israel. The job ahead amounted to activation of the bases and deactivation of the project.

Notes

1. Wall interview, May 81.
2. Kelly interview, May 81; Graw interview, Apr 81; Brown interview, Apr 81.
3. Davis interview; Graw interview, Apr and Oct 81; Kelly interview, May 81.
4. Peterson interview, Oct 81; Kelly interview, Oct 81; Wall interview, Oct 81; *ENR* 208 (22 April 1982): 75; Telex, NEPO to OAO, 30 Sep 80, sub: Nesher Cement Production Slowdown, IABPC, 33/3; OAO, Master Diary, 23 Oct 80, IABPC, 84/2; Griffis, P&C Journal, 22 Oct 80, IABPC, 41/1; Memo, Wall for PM, 30 Mar 81, sub: Deferment of MSA Cement Procurement, IABPC, 25/1.
5. Interv, author with Joseph R. Shaw, Oct 81 and Apr 82, Tel Aviv, Israel; Hartung interview, Apr 81; Shepherd, Daily Journal, 26 Feb 81, IABPC, 89/1; OAO, Master Diary, 27 Mar 80 and 14 and 15 May 81, IABPC, 84/4, 85/1; Memo, Gilkey for Area Engineers, 19 May 81, sub: Cross Leveling Conference, IABPC, 18/9; Ltr, Baer, Chief of Construction Division, NEPO, to Area Engineer, Ramon, 15 Apr 80, sub: Capital Equipment, IABPC, 33/1; *ENR* 208 (22 April 1982): 75.
6. The FAST contractor was made up of three constituent companies: Harbert International, Inc.; Paul N. Howard; and Louis Berger International; all of which were associated with the Perini Company as part of the Negev Airbase Constructors consortium at Ovda.
7. USACE, Permanent Orders 17-1, 10 Aug 81, IABPC, 87/9; *ENR* 207 (20 August 1981): 21; *ENR* 207 (10 September 1981): 13; Graw interview, Oct 81; Shaw interview, Apr 82; *Wall Street Journal*, 11 Mar 82; *Washington Post*, 18 Mar 82; USACE, Permanent Orders No. 33-2, 13 Oct 82, IABPC, 87/9; USACE, Permanent Orders 2-1, 16 Jan 84, IABPC, 87/9. The history of SCMO can be traced through the compilation of documents in U.S. Army Engineer Sinai Construction Management Office, After-Action Report: Construction of Facilities in Sinai Desert [1983], Office of History, HQ USACE files.
8. McNeely interview, Mar 84; Intervs, author with John E. Moore, Oct 81 and Apr 82, Tel Aviv, Israel; with Lt Col Steven G. West, Apr 82, Tel Aviv, Israel; with Alfred Lellis, Apr 82, Tel Aviv, Israel; with Leonard H. Gregor, Oct 81, Tel Aviv, Israel; USACE, Permanent Orders 17-1, 10 Aug 81.
9. Hartung interview, Apr 81; Memo, Wall for DOD PM, 2 Feb 81, sub: Restocking Charges for Fiat-Allis Spare Parts, IABPC, 25/3.
10. Wall interview, Oct 81; Graw interview, Oct 81; Kelly interview, Oct 81.
11. McNeely interview, Mar 84; N. Steinberg interview; J. Robert Moskin, *Among Lions: The Battle for Jerusalem, June 5-7, 1967* (New York: Arbor House, 1982), pp. 206, 218, 240-41; Bar-Tov interview, Aug 80, Apr 81, Oct 81, and May 82; Wall interview, May 81; MFR, Wall, 25 Jan 81, sub: LTG Joseph K. Bratton's Visit, 9 Through 14 Jan. 1981, IABPC, 75/1; Wall, Project Notebooks, vol. I, 22 Jun 80, IABPC, 90.
12. Wall, Project Notebooks, vol. IV, 18 Dec 80, IABPC, 90; Wall, Briefing for Incoming Officers, 14 Jun 81; USACE CERL, *Project Manager's Handbook for Special Projects*, Technical Rpt P-85/01, p. 48; Memo, Wall for DOD PM, 10 May 81, sub: ECPs, IABPC, 34/1; Memo, Gilkey for Area Engineers, 19 May 81, sub: Policy on Initiation of ECPs, IABPC, 34/1; Ltr, Hartung to Bar-Tov, 25 May 81, sub: ECP Summary, Hartung file, June-July 1981, IABPC, 49/13.
13. Shepherd, Daily Journal, 12-23 Mar 81, IABPC, 89/1; OAO, Master Diary, 16 and 18 Mar 81, IABPC, 85/1; MFR, Blake, 26 Mar 81, sub: Minutes of a Meeting with BG Wall and His Principal Staff, the Area Engineer and His Staff and the

Principals of the NAC Organization to Discuss Cost Growth and Materials Estimates, in OAO, Master Diary.

14. Wall interview, Oct 81; Wall, Project Notebooks, vol. V, 13 Mar 81, IABPC, 90; Shepherd, Daily Journal, 12 Mar–3 Apr 81, IABPC, 89/1.

15. Wall, Project Notebooks, vol. V, 31 Mar 81, IABPC, 90.

16. Wall, Project Notebooks, vol. V, 24 Apr, 8 May, and 14 Jun 81, and vol. VI, 24 Jun 81, IABPC, 90.

17. Wall, Project Notebooks, vol. V, 8 May 81, and vol. VI, 25 Jun 81; Peterson interview, Oct 81; Shaw interview, Oct 81.

18. Reimer interview, Feb 82; Moore interview, Oct 81; Shaw interview, Oct 81; Wall interview, Oct 81; West interview, Oct 81.

19. Wall interview, Oct 81; Ltr, Maj Gen Wilson to Wall, 30 Sep 81, sub: OCE Special Task Force Findings, IABPC, 58/1.

20. Hartung interview, Oct 81; Bar-Tov interview, May 82; Wall interview, Oct 81.

21. Wall interview, Oct 81; Shaw interview, Apr 82; Brown interview, Apr 82; U.S. Army Corps of Engineers, *Manual for Administration of Cost-Plus-A-Fixed-Fee Construction Contracts* (Washington, D.C.: OCE, 1 Jan 51), p. 9.

22. Hartung interview, Oct 81.

23. Graw interview, Apr 81; Wall interview, Oct 81; Peterson interview, Oct 81; Shaw interview, Oct 81.

24. Wall interview, Oct 81; Chapla interview, Aug 80; Memo, Wall for Contracting Officers, 17 Sep 81, sub: Control of Contractor Obligations, IABPC, 18/9; West interview, Oct 81.

25. West interview, Oct 81 and Apr 82; Hartung interview, May 82.

26. West interview, Oct 81; Memo, Wall for Contracting Officers, 17 Sep 81, sub: Control of Contractor Obligations; Memo, Moore for Manager, Israel Branch, DCAA, 20 Sep 81, sub: Request for Materials Cost Audit, file 301–07, Financial Management Reference Papers (1981), IABPC, 18/8; Ltr, Wall to Wilson, 17 Sep 81, sub: OCE Audit Team Results, IABPC, 58/1.

27. Ltr, Wall to Wilson, 17 Sep 81, sub: OCE Audit Team Results; Chapla interview, Apr 81; Ltr, Wilson to Wall, 30 Sep 81, sub: OCE Special Task Force Findings; Ltr, Wall to Hartung, 9 Oct 81, sub: Funding Increase to the Plan of Work (POW) for the Israeli Airbase Program, IABPC, 49/15; Ltr, Wall to Wilson, 13 Oct 81, sub: Program Cost Underestimate Management, IABPC, 58/1. For General Provision 3(d), Limitation of Funds, see, for example, Contract for Design and Construction of Airbase, Ovda, Israel, 18 May 79, IABPC, 38/2.

28. Shaw interview, Oct 81; Chapla interview, Apr 81; Hartung interview, Apr 81.

29. Wall, Project Notebooks, vol. VI, 2 and 11 Aug 81, IABPC, 90.

30. Wall, Project Notebooks, vol. VI, 14 Oct 81, IABPC, 90.

31. Wall interview, Oct 81; Parkes interview, Oct 81.

32. Telex, USDAO Tel Aviv (Gilkey) to DAEN-MPC, 20 Apr 79; Thomas interview, Apr 80; Ltr, Gilkey to Hartung, 18 Mar 80, sub: Construction/Site Activation Schedule Interface—Ovda Air Base, IABPC, 32/3; Ltr, Wall to Wray, 2 Oct 80, sub: Construction Site Interface Schedule, IABPC, 33/4; Butler, ABC Weekly Sitrep, 28 Oct 80, ABC Weekly Sitreps, July–Dec. 1980, RAO file 201–02, NEPO files, Box R–1.

33. Proceedings of Press Conference, 12 Jun 80; OAO, Master Diary, 6 Jan and 3 Feb 81, IABPC, 85/1. This evaluation focused on four areas: the degree of completion required for the Israelis to begin installation and check out; special Israeli requirements, including priority work space, room for support equipment, open storage at the facility, temporary utility supply, and specific security arrangements; the nature of the work to be done by Ministry of Defense crews, the projected number of activators in a facility, and the duration of their work; and problems that might affect the schedule. Memo, Wall for Area Engineers, 22 Apr 81, sub:

NEPO/IABAO/IABAR Procedures as Concerns Construction Site Activation Interface Planning, IABPC, 25/3.

34. RAO, Daily Journal, 1 and 10 Jul 81, file 1515-13, NEPO files, Box R-1, IABPC, 48/8; OAO, Master Diary, 4 and 5 May 81, IABPC, 85/1.

35. OAO, Master Diary, 6 May 81, IABPC, 85/1.

36. There are numerous late-1981 examples of this type of letter in the Ramon central reference files. For example, see Ltr, Griffis to Butler, 20 Aug 81, sub: Construction Interface—Site Activation: Final Turnover of Permanent Facility No. 37, Facility Item No. 275, Site Work for Temporary Synagogue, IABPC, 23/5.

37. Procedures for Turn-over of Facilities, Attachment to Memo, Wall for Area Engineers, 7 Jul 81, sub: Upward Reporting—Facility Transfer, IABPC, 49/13.

38. Ltr, Griffis to Wall, 21 Aug 81, sub: Site Activation Interface Meeting of 9 Aug. 1981, IABPC, 24/1; Kelly interview, Oct 81; Moore interview, Oct 81; Peterson interview, Oct 81; Parkes interview, May and Oct 81.

39. Parkes interview, May and Oct 81; Kelly interview, May and Oct 81; MFR, Grafa, 6 May 81, sub: Minutes of General Staff Meeting for 6 May 1981, in OAO, Master Diary, IABPC, 85/1; RAO, Daily Journal, 14-16 Jul 81, IABPC, 48/8.

40. Moore interview, Oct 81 and Apr 82; Kelly interview, Oct 81.

41. MFR, Wall, 25 Jan 81, sub: LTG Joseph Bratton's Visit, 9 Through 14 Jan. 1981; *Los Angeles Times*, 15 Apr 81; (Long Island) *Newsday*, 17 Aug 81; *Jerusalem Post*, 17 Aug 81.

42. RAO, Daily Journal, 1, 9, 12-16, 25, and 27 Jul 81, IABPC, 48/8; Brochure, Ramon Airbase Sunday 28 June 1981, First Aircraft Landing, IABP files, WNRC, Accession 77-83-1005, Box 2; *Jerusalem Post*, 3 Jul 81.

43. Wall interview, Oct 81; Peterson interview, Oct 81; Hartung interview, Oct 81; Parkes interview, Oct 81; Bar-Tov interview, Oct 81; *Jerusalem Post*, 9 Nov 81; RAO, Daily Journal, 29 and 30 Sep 81, IABPC, 48/8.

44. Parkes interview, May 81; Thomas interview, Apr 81; Kelly interview, May 81; OAO, Master Diary, 23 Apr 81, IABPC, 85/1.

45. Griffis, P&C Journal, 23 Apr 81, IABPC, 41/1; Hartung interview, Apr 81; Wall interview, May 81.

46. Wall interview, Oct 81; Grafa interview; Bar-Tov interview, May 82; Shepherd interview, Oct 81 and May 82; DF, Harris to the Project Manager, 5 Sep 80, sub: MSA Lessons Learned, IABPC, 86/1.

47. Wall interview, Apr 80 and Oct 81; RAO, Office Memorandum 10-1-2, Realignment of Function of Construction Branch—Ramon Area Office, 17 Feb 81, IABPC, 23/5; Memo, Carl R. Smith, Chief, Construction Branch, RAO, for Construction Branch Personnel, 9 May 81, sub: Letter of Instruction—Project Engineer, IABP files, WNRC, Accession 77-83-1001, Box 1.

48. The seven assignment areas were shelters, including mechanical systems; concrete facilities; preengineered buildings; mechanical and miscellaneous systems; roads and runways; utilities distribution; and utilities structures. DF, Taylor to Project Engineers, 1 Jun 81, sub: Assignment of Project Engineers, IABP files, WNRC, Accession 77-83-1001, Box 1.

49. RAO, Daily Journal, 15 Aug 81, IABPC, 48/8.

50. Ltr, Hartung to Moore, 18 Sep 81, sub: Construction Completion Scheduling, IABPC, 49/14; Ltr, Wall to Hartung, 1 Oct 81, sub: Construction Completion Scheduling, IABPC, 49/15; OAO, Master Diary, 18 Oct 81, IABPC, 84/3; *Philadelphia Inquirer*, 9 Nov 81; RAO, Daily Journal, 23-27 Oct 81, IABPC, 48/8.

51. Ltr, Wall to Bratton, 5 Nov 81, sub: Monthly Progress Report, Israeli Airbase Program, IABPC, 88/6.

52. Remarks of Prime Minister Menachem Begin, 8 Nov 81, IABPC, 74/3; Ltr, Wall to Wilson, 8 Nov 81, IABPC, 74/3; (Tel Aviv) *Ma'ariv*, 13 and 20 Nov 81.

53. (Tel Aviv) *Ma'ariv*, 10 Nov 81.

54. Kelly interview, Oct 81; Hartung interview, May 82; Wall interview, May 82; Shepherd interview, May 82.

55. Wall interview, May 82; Blake interview; Peterson interview, May 81; Butler interview; Davis interview; Grafa interview; Ltr, Wilson to Wall, 30 Sep 81, sub: OCE Special Task Force Findings, IABPC, 58/1.

56. Merav Halperin, "The Inauguration of Ramon and Ovda," *Biton Heil Ha'avir*, Oct 81.